

Step One

Define the system

Purpose:

The purposes of this step are to have a description of all the characteristics of the system that is being studied and to prepare for gathering data on the system.

Outcomes:

The outcomes of this step are a complete description of the system, a project statement, and a data gathering plan.

Tools:

Flow chart, operational definition, sampling, check sheet, run chart

What is the name of the system you have chosen to improve?
(Write this as a phrase: lunch serving, writing a paragraph, filling course requests, writing new curricula, completing homework assignments, etc.)

In the example this is fourth grade writing.

Define the system

Who is the primary customer of the system? Remember, it can be either an internal or an external customer.

In our example, the team discussed the various customers: teachers, students, parents; however, they decided that the primary customer is the students.

What is the most important need of the customer as it relates to the system you have chosen?

In our example, it is written communication skills.

What is the purpose of the system? Keep in mind that the purpose should always be to meet the customer's need.

In the fourth grade example, the purpose is to help students develop writing skills.

Define the system

What is the output of the system? That is, what does this system produce or deliver to accomplish its purpose?

In our example, the output is the ability to write proficiently to the state performance standard.

What does the customer expect of the output?

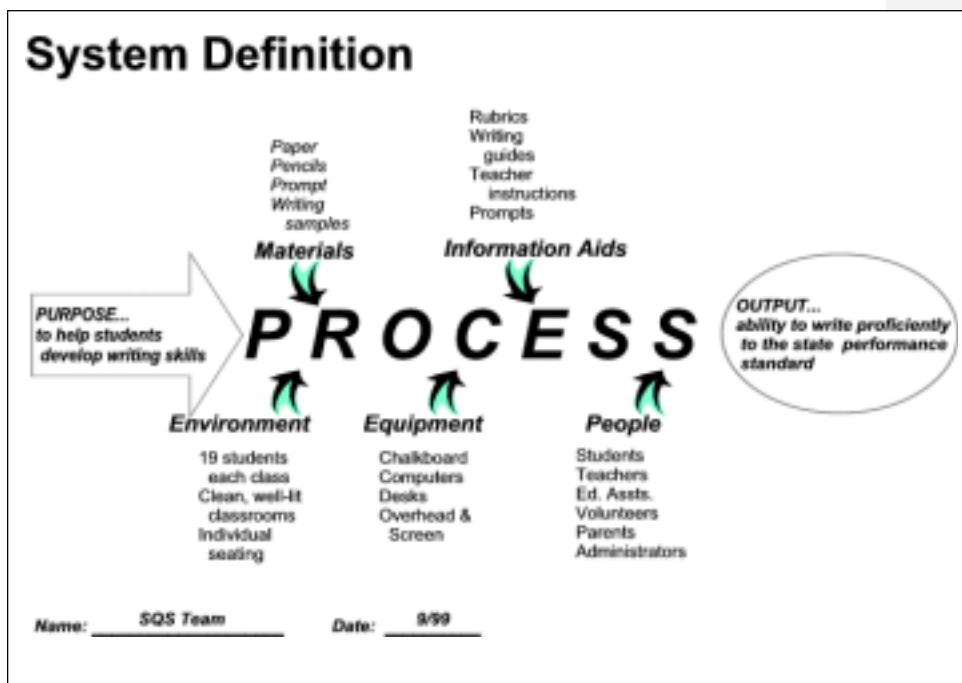
In the example, the student expects that his or her skills will develop during the course of the year.

What resources are currently being used to produce the product or service?

Define the system

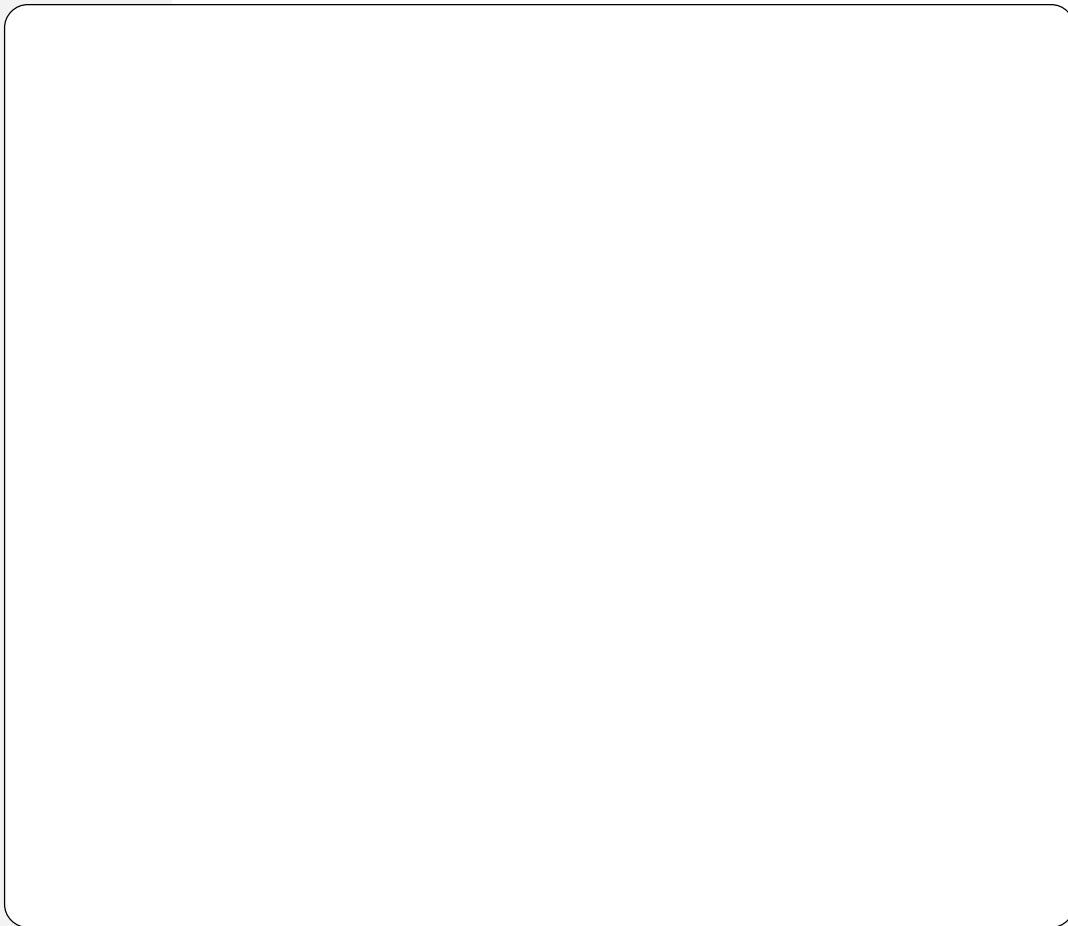
The team in our example listed materials, information aids, equipment, and people. They also described relevant aspects of the learning environment.

The improvement team consolidated all its information from the questions about system elements and mapped it to the System Definition Form shown below.



Define the system

Draw your own System Definition Form in this space. Complete all the sections, referring to your answers to the questions on pages 4-7.

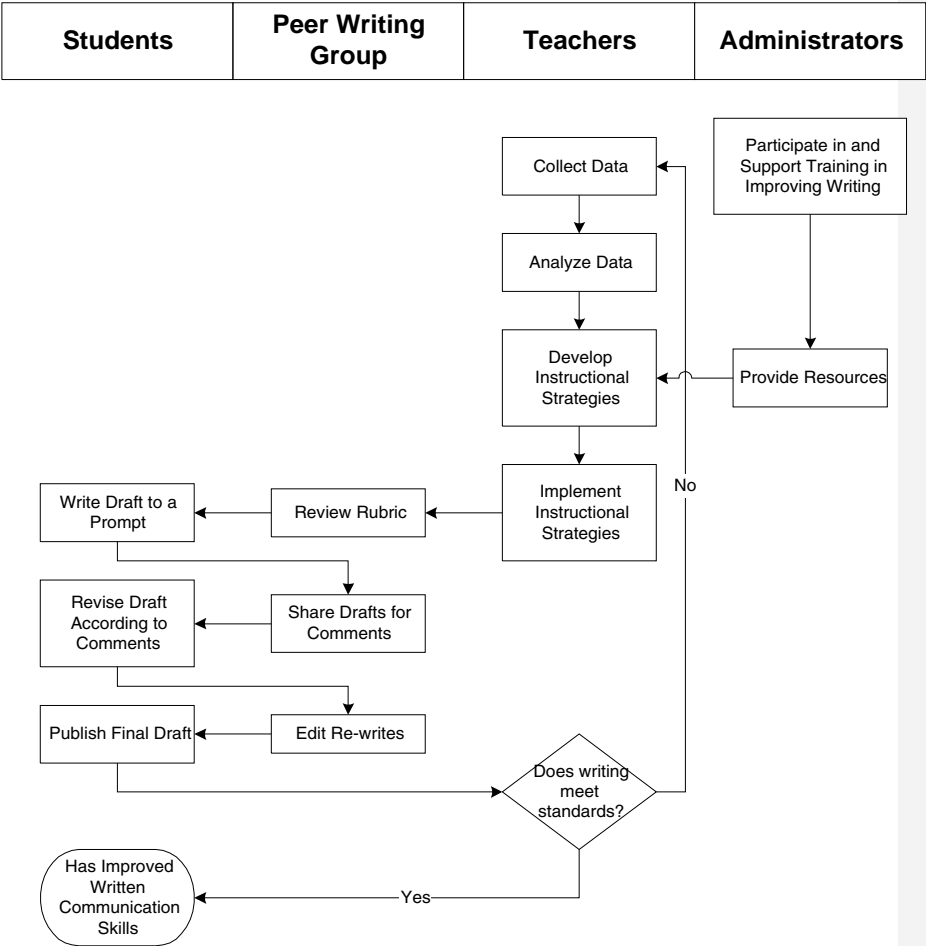


Define the system

Now that your team has described the system it wants to improve, you are ready to show a step-by-step picture of the key process.

THE TOOL TO USE HERE IS A **FLOW CHART**.

The flow chart for the fourth grade writing process is shown below.



Define the system

Show your team's flow chart here. Date the chart and list the names of the people who worked on it.

Define the system

Once you have completed the flow chart for the process that your team is studying, check for obvious problems, omissions, or disconnects. If there are things that need to be modified and everyone affected by the modification agrees that it will improve process performance, then make the change! Be careful, however, to consider all the possible effects on this process and the other interrelated processes in the system as a whole. Once the change has been made, correct the flow chart so it reflects the new/improved process.

In the fourth grade writing process there were no obvious problems, omissions, or disconnects.

What obvious problems, omissions, or disconnects did your team find in your flow chart? How did you handle them?

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The next decision that team members need to make is what to measure. Some of the questions they need to consider are these: How will they know whether they have made an improvement? What are good indicators of how the process is doing? What is important to the customer?

The main concern could be timeliness (Was the writing assignment turned in on time?), accuracy (How many errors were made while writing the assignment?), or attitude (How did the student feel about writing?). Choose the one or two most critical measures for your system.

The fourth grade writing SQS team decided that the two best indicators for knowing how they were doing and if they were making improvements in the writing process were 1) number of writing errors and 2) student attitude toward writing.

What are your team's measures?

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Once you decide what to measure, write your project statement.
The format for the project statement is as follows:

To improve _____ (name of system) _____, as
measured by _____ (measure 1, measure 2, etc.) _____.

The project statement for our example is: To improve the writing skills of the fourth grade students in two classes as measured by the writing errors made and students' attitudes toward writing.

The team later revised the statement to reflect only organization skills.

What is your project statement?

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Now that you have written your project statement and decided what to measure, you need to decide how to go about getting data on those measures. In other words, you need to define each of your measures so that all those involved will understand just exactly what the measures mean.

THE TOOL TO USE HERE IS **OPERATIONAL DEFINITION**.

The fourth grade team operationally defined writing errors as follows:

Quality Measure: #1

1. **Characteristic of interest:** **Writing Errors**
2. **Measuring instrument:** **District (and State) Writing Rubric for Fourth Grade**
3. **Method of test:** **The two teachers will sample 5 papers from each class at random each week. They will swap papers so that each scores all ten papers. They will score papers to the district writing rubric and record their observations on a tally sheet.**
4. **Decision criteria:** **The teachers will adhere strictly to the rubric, noting errors in the categories given by the rubric.**

Name: **SQS Team**

Date: **9/99**

The fourth grade team operationally defined students' attitudes about writing as follows:

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Quality Measure: #2

1. Characteristic of interest: Student Attitude Toward Writing
2. Measuring instrument: Elementary Writing Survey
3. Method of test: The Elementary Writing Survey is administered to all the children in both classes in the fall and again in the spring. Results will be tallied and compared.
4. Decision criteria: All responses will be tallied by item.

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Date: 9/99

Define the system

What are your team's measures? Operationally define all of them, using the four-part form in the example.

Measure #1: _____

Measure #2: _____

Define the system

After all measures have been defined, additional decisions have to be made.

The first two of these is how much data to take at one time and how often to take the measurements.

THE TOOL TO USE HERE IS **SAMPLING**.

Notice that sampling can include taking 100% of available data or some fraction of the total. Using all the data available is called "100% sampling."

The sampling plan for the second grade writing team is:

Writing Performance

Choose papers at random; each teacher scores all ten papers: 5 papers per class; both classes, weekly.

Attitude Toward Writing

Two surveys per year; survey all children; record all responses.

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The next decisions the team must make are where the measurements (data) will be collected, who will take the measurements (data), and what method will be used.

In our example, the where and who are the same for both measures but the method is different.

Show your team's data gathering plan below.

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The final decision to be made is the method or format the team will use to collect and display the data.

THE TOOLS YOU MAY WANT TO USE ARE **CHECK SHEET, RUN CHART, SCATTER DIAGRAM AND/OR PARETO DIAGRAM.**

As the data gathering plan indicates, the fourth grade writing improvement team used the check sheet and survey to collect their data. They displayed their data in Pareto Diagrams, run charts, and scatter diagrams.

Show your team's method for collecting data (check sheet, run chart, Pareto diagram, and/or survey) for each quality measure.